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CLAIMS

1 claim:

1. A device for displaying an image with an illusion of depth, comprising:

a first surface, said first surface being substantially transparent and at least part of said first surface displaying a first pattern of features of periodic nature with a substantially constant period; and

a second surface, at least part of said second surface displaying a second pattern of features of periodic nature with a substantially constant period;

wherein said first surface is intermediate an observer and said second surface;

wherein said period of said second pattern differs incrementally from the period of said first pattern;

wherein said period of at least part of at least one of said patterns has a slow variation;

wherein said first and second surfaces are spaced apart by a distance larger than the period of either of said first and second patterns; and

wherein said incremental difference in the periods of the patterns, said spacing between the first and second surfaces, and said variation in the period of said at least part of at least one of said patterns are selected such that the interaction of said first and second patterns produces a Moire image exhibiting continuous three-dimensional visual effects.

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2. A device for displaying an image with an illusion of depth according to claim 1 and wherein said features comprise a series of lines.

3. A device for displaying an image with an illusion of depth according to ~~any of~~ ^{claim 1} the previous claims and wherein sections of said features are shifted horizontally with respect to each other in different horizontal bands of said patterns, to produce images with varying vertical detail.

4. A device for displaying an image with an illusion of depth according to claim 1 or claim 2, wherein said features are arranged in a substantially vertical direction, and

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said variation of the period of at least part of at least one of said patterns takes place in a substantially horizontal direction.

5. A device for displaying an image with an illusion of depth according to claim 1 and wherein the views of said image as seen by each of an observer's two eyes are mutually displaced in such a way as to exhibit realistic three dimensional effects by means of the static parallax effect.

6. A device for displaying an image with an illusion of depth according to claim 1 and wherein the appearance of said image changes with change in the position of a viewer in such a way as to exhibit realistic three dimensional effects by means of the motion parallax effect.

7. A device for displaying an image with an illusion of depth according to claim 1 and wherein the feature size of said image changes with the apparent depth in such a way as to comply with the mind's perception that distant objects appear to have narrower details and close objects have wider details.

8. A device for displaying an image with an illusion of depth according to claim 1 and wherein the feature size of said image changes with the apparent depth in such a way as to comply with the geometric perspective effects that features on a tilted surface appear narrower than those on a flat surface by approximately the cosine of the tilt angle.

9. A device for displaying an image with an illusion of depth according to claim 1 and wherein the brightness of features of said image changes with the apparent depth in such a way as to comply with the shading effect or any other desired lighting effect.

10. A device for displaying an image with an illusion of depth according to claim 1 and which can be viewed by the observer's naked eye without the need for any special viewing aids such as special spectacles.

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11. A device for displaying an image with an illusion of depth according to ~~any one of claims 1 or 5-10~~ and wherein said second surface is transparent.

12. A device for displaying an image with an illusion of depth according to ~~any one of claims 1 or 3 - 10~~ ^{any one} and wherein said second surface is translucent.

13. A device for displaying an image with an illusion of depth according to any one of claims 1 or 5-10 and wherein said second surface is opaque.

14. A device for displaying an image with an illusion of depth according to any one of claims 1 or 5 - 10 and wherein said spacing of said surfaces is between 5 and 100 times said pattern period.

15. A device for displaying an image with an illusion of depth according to any one of claims 1 or 5 - 16 and wherein both of said surfaces are printed with patterns of the same color.

16. A device for displaying an image with an illusion of depth according to any one of claims 1 or 5-10 and wherein both of said surfaces are printed with patterns of different color.

13. A device for displaying an image with an illusion of depth according to any one of claims 1 or 5 - 10 and wherein said second surface background color is different from that of any of the other said printed patterns.

18. A device for displaying an image with an illusion of depth according to any one of claims 1 or 5-10 and wherein said two surfaces are disposed on the opposite sides of a transparent plate.

19. A device for displaying an image with an illusion of depth according to any one of claims 1 or 5 to 19 and wherein said first surface is disposed on one side of a transparent plate, and said second surface is a thin printed layer disposed close to the second side of said plate.

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A A
 20. A device for displaying an image with an illusion of depth according to any one of claims 1 or 5 - 10 and wherein both first and second said surfaces are thin printed layers disposed on both sides of a plate.

A A
 21. A device for displaying an image with an illusion of depth according to any one of claims 1 or 5 - 10 and wherein said first surface is disposed on one side of a transparent plate, said second surface is disposed on one side of another plate, said plates being disposed at a fixed distance from each other such that said surfaces are spaced from each other by a predetermined distance.

A A
 22. A device for displaying an image with an illusion of depth according to any one of claims 1 or 5 - 10 and wherein at least one of said first and second surfaces is constructed of wire netting.

A A
 23. A device for displaying an image with an illusion of depth according to any one of claims 1 or 5 - 10 and wherein at least one of said first and second surfaces is thin and flexible such that it can be rolled on a cylinder.

A A
 24. A device for displaying an image with an illusion of depth according to any one of claims 1 or 5 - 10 and wherein said device is illuminated from the rear.

A A
 25. A device for displaying an image with an illusion of depth according to any one of claims 1 or 5 - 10 and wherein said device is illuminated from the front.

A A
 26. A device for displaying an image with an illusion of depth according to any one of claims 1 or 5 - 10 and wherein said device is illuminated from at least one of its edges.

A A
 27. A device for displaying an image with an illusion of depth according to any one of claims 1 or 5 - 10 and wherein said device is constructed and operative for large area use such as in billboards.

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28. A device for displaying an image with an illusion of depth according to ~~any one~~
~~of claims 1 or 3, 10~~ and wherein said device is constructed and operative for small area
use such as in credit cards.

29. A device for displaying an image with an illusion of depth, comprising:
first and second surfaces, first one of which is transparent, each having at least
part of its surface printed with a predetermined pattern of substantially periodic features;
said surfaces being spaced apart by a distance considerably larger than the period
of said features; and
the spacing of said surfaces being varied in a predetermined manner such that
the interaction of said two patterns produces a Moire image exhibiting continuous three
dimensional visual effects when viewed from said first surface side of the device.

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